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Aseel Farhat* (afarhat@indiana.edu), **Michael S. Jolly** and **Edriss S. Titi**. *A Data Assimilation Algorithm for the Bénard Convection Model and Other Models of Turbulence.*

Data assimilation is the process by which observations are incorporated into a computer model of a real system. Applications of data assimilation arise in many fields of geosciences, perhaps most importantly in weather forecasting. In a joint work with M. Jolly and E. S. Titi, we present a new continuous data assimilation algorithm for the two-dimensional Bénard problem based on an idea from control theory. Rather than inserting the observational measurements directly into the equations, a feedback control term is introduced that forces the model towards the reference solution. We show that the approximate solutions constructed using only observations in the velocity field and without any measurements on the temperature converge in time to the reference solution of the two-dimensional Bénard problem. Similar results for other models of turbulence will be presented. (Received January 18, 2015)